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FOREST SERVICE

BRANCH OF RESEARCH

MONTHLY REPORT

OF

FOREST EXPERIMENT STATIONS

FOREST PRODUCTS

FOREST ECONOMICS

RANGE RESEARCH

NOV - 1933



BRANCH OF RESEARCH

November, 1933

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RELATIONSHIP BETWEEN THE RATE OF GROWTH
IN BLACK LOCUST AND SURVIVAL OF LOCUST BORER LARVAE

by Ralph C. Hall.

During the past field season a study was conducted on the survival of locust borer larvae under a wide variety of site conditions. Fifty sample plots were used for this purpose, each plot containing about twenty trees, with five trees in each of the four crown classes. These plots were located in Ohio, Indiana, Illinois, Kentucky, Tennessee, Michigan, Pennsylvania, and New York.

In the early spring a count of all young larvae was made on each tree. A wet patch on the bark or exudating frass was taken to denote points of attack. A subsequent examination in the late fall and winter was made and all fresh emergence holes were counted. In this way, it was possible to determine the survival per cent for the larvae for the summer and fall period. During the previous field season no feasible method had been devised whereby it would be possible to determine the points of attack in the fall without destroying the young larvae, and for that reason the present study is concerned only with partial survival of larvae. However, it seems reasonable to expect a high mortality in young larvae over the winter period. Spring and fall measurements of diameters were also taken and from these figures it was possible to determine the rate of growth coincident with the development of the larvae.

The results of this study clearly demonstrate a very close relationship between increase in diameter growth and locust borer larvae survival. The following table shows this relationship.

Increase in DBH Inches	Number of trees	Av. Survival locust borer larvae Per cent
0	43	94
.01 to .05	153	73
.06 to .10	139	47
.11 to .15	100	36
.16 to .20	67	17
.21 to .25	58	9
.26 to .30	27	3
.31 to .35	26	2
.36 to .40	12	2
.41 to .45	9	0
.46 to .50	5	0
.51 to .55	2	0
.56 to .60	2	1
.61 to .65	-	-
.66 to .70	3	0
.71 to .75	2	0

(Over)

It will be noted from this table that survival of locust borer larvae is about 100 per cent in trees which show no increase in diameter, and that survival of larvae decreases as the rate of growth increases. Trees which increase in diameter more than .3 of an inch per year will show practically no survival of larvae irrespective of the number of larvae which start. For example, one dominant tree on a plot in Pennsylvania had 106 active larvae when the spring count was made and had but one emerging adult in the fall, or less than one per cent survival of larvae. This tree increased in diameter .7 of an inch.

The results of this study further contribute to the evidence that locust borer injury and vigor of the tree are very closely associated.

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EMERGENCY CONSERVATION WORK IN PATHOLOGY

by R. M. Lindgren.

Research

Research done under Procurement Authority 556- Pathologists have been employed as follows: One in the Northeast for work on the beech bark-disease Nectrias; 2 on elm disease transmission studies in cooperation with entomology research technicians; 2 on pine canker in the South; 1 on the black locust nursery disease; and 4 in the East and Southern Appalachians on control of the Nectria and Strumella canker fungi on hardwoods and on the entrance of decay through cut and standing dead companion sprouts. Indications from the sprout decay study in Pennsylvania are that the hazard from decay entry through dead standing sprouts is low and that girdling therefore may be an effective way of eliminating undesirable sprout stems. One man has been working on the distribution and cause of the resinosis disease of pine nursery stock and young plantations in the Northeast with a view particularly of helping to determine the policy to be followed in the use of stock from diseased nurseries in the coming planting operations. In Region 3, two men have been working on twig canker, which is the object of camp activities on the Prescott National Forest, and on methods of disposal of conky trees to avoid spore distribution. Two men are engaged in the Pacific Northwest in experimental work bearing on Blister Rust control. The activities of these men are being directed and supplemented by regular members of the Bureau force.

Activity Against Introduced Diseases

The larger number of the Technicians have been used on service work in connection with introduced diseases, particularly the Dutch elm disease. The major activity against the Dutch elm disease has been on N. R. A. funds. The restriction to certain States has made it necessary to carry all of the work in the States of Maine, Maryland and Virginia on E. C. W. as well as the laboratory service work at Wooster, Ohio. It is impossible to separate the accomplishments by N. R. A. and E. C. W. employees. As many enrolled men as the CCC could spare have been used in New Jersey where the main infection is located. Winter scouting particularly in regions where the

disease is known to be present has been found feasible through development of a method of collecting portions of twigs and branches and culturing them in the laboratory. Cleaning up infected trees in areas of disease occurrence is thereby possible during the winter. The number of trees known to have the disease to date has been: New Jersey 751, New York 62, Connecticut 1, and Maryland 1. The known limits of infection were not extended during November. Essex County, New Jersey, continues to be the main center of infection, 616 cases having been discovered here. Further infections in Baltimore have been sought but without result. Control work being done on N.R.A. funds is being transferred to the Bureau of Entomology and Plant Quarantines, but scouting for infections outside of the original areas will continue to be handled as a B.P.I. function. One E.C.W. Technician used in the elm campaign has been transferred to scouting work on the epidemic willow scab.

Service on Native Diseases in Stand Improvement Activities

Service activities on native diseases in connection with stand improvement programs have continued. Three technicians and one regular employee of the Bureau have visited camps with the purpose of inspecting for diseases on cultural areas and advising on desirable sanitation activity. Ten Federal camps were visited for the first time and revisits were made to 2 others; 18 State camps were visited and office demonstrations and conferences with cultural foremen of 7 more. The nature of the work on T.V.A. areas did not justify the contemplated disease service assistance on such areas in November.

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APPALACHIAN FOREST EXPERIMENT STATION

Management - Mountains

Buell prepared a volume alignment chart for yellow poplar (total cubic feet inside bark) from 30 trees felled in thinning operations at Cranberry, N. C. These included larger trees from the crop tree thinning as well as smaller ones cut in the thinning from below. This chart will be used to compute all yellow poplar volumes in the series of thinning plots at Cranberry.

A logarithmic multiple regression equation was computed, from which the chart was made. The aggregate deviation of the chart from the basic data was 0.08 per cent, the chart being lower than the basic data. The average deviation was 4.41 per cent.

A comparison of volumes computed from the regression equation with the volumes of trees of the same size given in Table 13, of technical bulletin No. 356, for second-growth yellow poplar, Pike County, Ohio, and Fairfax County, Va., shows that the volumes computed for Cranberry are higher than those of Table 13, in the 50 to 90 foot classes and slightly lower for the 100 foot classes, the average amounts being given below:

Height Class	No. d.b.h. classes in height class.	Average deviation of Cranberry figures from McCarthy's (Per cent)
60	5	+ 30.4
70	7	+ 19.3
80	9	+ 11.8
90	9	+ 5.3
100	7	- 0.7

This variation may be due, in part at least, to the fact that the method of constructing the volume tables differed in the two cases, Table 13 having been made from taper tables compiled by the form quotient method, and to the fact that a smaller range of diameters and heights were used in constructing the table for Cranberry. On the other hand it may indicate that the Cranberry trees of the lower height classes have a higher form factor than those of Pike County, Ohio, and Fairfax County, Va.

Management - North Georgia

With the help of Bosley, Brender and two C.C.C. boys as recorders, Barrett completed measurements of the five quarter-acre white pine release plots on the Toccoa Experimental Forest. Undesirable overstory trees killed back by a solution of sodium arsenite continue to show less sprouting proclivity than the girdled trees.

Biological Investigations

Burleigh spent a week in Washington in conferences, and technical studies at the National Museum. He attended the 50th Annual Meeting of the American Ornithologists' Union at the American Museum of Natural History in New York.

Forest Entomology

During October and November Huckenpahler has been inspecting the timber stand improvement work at C.C.C. camps to determine past or potential insect damage. In the southeast special emphasis is placed on the barkbeetles, Ips and the southern pine beetle, Dendroctonus frontalis Zimm.

Forest Pathology

In their study of the Nectria canker disease F. G. Liming and C. H. Hepting have completed cross-inoculations at Bent Creek and near Barnardsville, North Carolina. They have also made a series of inoculations to determine the relationship between crown class and susceptibility.

J. D. Diller and M. L. Lohman, investigating the "Atropellis" pine canker disease in the southeast, have completed several series of inoculations at Bent Creek and at Clemson College, S. C. Diller has begun a

study of the age of main-stem and large branch cankers from various localities with the determination of the probable direction of spread of the disease in view. In his eradication studies he has established field plots near Pontiac and Preguall, S. C.

Fire-Weather

November 1 marked the beginning of the fall season fire-weather forecasting activities in this district by L. T. Pierce of the U. S. Weather Bureau. Regular telegraphic and telephonic reports from the 13 fire-weather observers were begun on this date but no forecasts except an initial set were issued until November 8, due to the favorable weather conditions. During the remainder of the month high fire hazard prevailed, except for two periods of rain; one on the 13-14 and another 22-24, when sufficient rain fell to be of considerable benefit. The period was characterized principally by deficient rainfall, high winds, and freezing temperatures, and several destructive fires occurred principally on private land in non-cooperating counties.

According to the practice which was instituted last spring, telegraphic forecasts were sent at Weather Bureau expense to the Regional Forester, and Forest Supervisors of this region and they were made available to the public through the radio facilities of WWNC, WNOX, WDOO, and WSM in Asheville, Knoxville, Chattanooga, and Nashville, respectively.

The forecasting service will continue in operation until the cessation of destructive fire hazard.

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CALIFORNIA FOREST EXPERIMENT STATION

Forest Management - Pine Region

Work at the Stanislaus Branch was completed for the season. Seed counts made in 108 seed traps spaced two chains apart on methods-of-cutting plots showed good distribution of seed. The maximum found in a trap was 20. Only three traps failed to collect seed. Due to rodents, practically no seed could be found on the ground outside the traps.

Ponderosa pine seedlings were planted in one of the site factor station enclosures to determine possible effects of root pruning on survival and growth. One hundred seedlings with roots pruned to 8 inches, and another hundred with roots pruned to 12 inches were set out, using 1-0 stock.

The motor-driven portable saw developed by Curry and Morrow for fire work was tried out on stand improvement work on the Stanislaus. The saw cut satisfactorily in trees up to 4 or 5 inches d.b.h. On steep slopes with considerable down logs it was found somewhat cumbersome.

Forest Management - Redwood

The report on the conditions on redwood cutover land continues to absorb most of the time of Person and Hallin. The material included in the

report was used as the basis for recommendations to the Redwood Division of the Lumber Code Authority at a meeting held in San Francisco. The condition of redwood cutover lands under present logging practice as to adequacy of seed trees and stocking was shown by means of charts, as was also the effectiveness of seed trees and the ill effects of grazing. The advantages of obtaining natural reproduction instead of depending upon planting, and the necessity of seed trees to maintain forest conditions on cutover lands was emphasized.

Fire Research

The Station has undertaken the study of the use of chemicals to control sprouting and wild growth. Dr. Gifford J. Ikenberry, formerly Professor of Botany at the University of South Dakota, has been retained on this work.

Fire Detection Planning.

The field visibility mapping crews struggling with the steep slopes and chaparral of the four southern forests and Los Angeles County. These units will complete the program, and it is hoped that all compilations will be finished in January.

Visibility ratings for the 1933 test fires were completed. A laboratory experiment to determine the effect of direction of illumination upon the visibility of smokes was planned and work was started in assembling equipment for the experiment, which is to be carried on in the old C. E. Radiation Laboratory of the University.

Communication Planning

Work on the Regional communication system, to which Brown has been assigned in cooperation with a Regional representative, is underway on the Plumas as the second forest on the list. In their search for a measuring stick for phone line ratings, the Committee has adopted the decibel. By its use it is hoped that potential capacity of any combination in a telephone circuit can be rated. Results on the Eldorado checked very well with field experience. Although static has to be considered as a separate problem, the decibel unit shows promise of being most valuable in the planning work.

Forest Products

Logging and Milling Studies

One new job has abruptly descended into the logging and milling study department and another is in immediate prospect. The one under way is the computation and compilation of costs and values by logs, trees, and cutting systems on the basis of the new minimum wage scales and lumber selling prices recently set up by the western pine industry as part of the new code. Work has not progressed to a point where any final results can be quoted. Code minimum wages are about 20 per cent less, on the average, than the 1929 rates used in the Stanislaus study bulletin. Minimum code selling prices compare with 1929 prices as follows:

Sugar pine	-	18 per cent less
Ponderosa pine	-	11 per cent less
White fir	-	31 per cent less
Incense cedar	-	5 per cent less

For the Stanislaus woods study area as a whole, these figures give a weighted average selling value shrinkage of 19.7 per cent (code minima under 1929 actual), corresponding very closely with the difference in wage rates.

The job in prospect is a new study to be undertaken on the operation of the Weed Division, Long-Bell Lumber Company. They are logging in the east-slope ponderosa pine region. The Company requested the Station to conduct the project, voluntarily offering to hire the study crew personnel, Yarding, loading, and transportation studies will be undertaken first. After hoping vainly all season that a few dollars could be found in some nook or cranny for taking on a few temporary field men to keep our Products programs going, at least in low gear, while other lines are speeding in high on emergency funds, it is a life-saver to this Research Cinderella to receive such a proposal for logging and milling study work from one of the largest lumber concerns in the State. The proposal is especially gratifying since it comes as an entirely unsolicited and convincing evidence that information such as that resulting from our Stanislaus study has sufficient practical value that this big industrial organization believes it can afford to pay the cost itself, in the leanest of times, in order to have similar data on its own operations.

California Economic Research Council

At the annual meeting of the Council the major subject of discussion was the research and statistical services of the Federal government, and means of complying with the request for helpful recommendations from the Council. Professor Weeks and the Station have been asked for recommendations respecting statistics needed for land use study as a result of their cooperative study of the land utilization of El Dorado County.

Hill reported to the meeting for the Natural Resources Committee on the progress in land utilization research in California. This Committee was also instructed to canvas and follow up available means of preventing serious lapse in the Geological Survey topographic mapping in California, including the possibility of securing federal emergency funds to speed that work which is important in type mapping as well as land utilization studies.

The Council also voted to establish an additional Standing Committee on Government Research. One of the first subjects for consideration will be possible means for bettering the chaotic and altogether unsatisfactory present State policies and machinery for the handling and disposition of tax delinquent lands.

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CENTRAL STATES FOREST EXPERIMENT STATION

Cooperation - Ohio State University

The request of the Station for more space for a storage and work room is receiving consideration by the University authorities. Recently there has been considerable correspondence between the Station and the University regarding an expansion of forestry instruction to agricultural students.

Illinois

Baker and Day spent from October 30 to November 3 on the Shawnee National Forest Purchase Unit in southeastern Illinois, locating an area suitable for a branch station and experimental forest. An excellent tract containing forest and waste land conditions typical of the region was found between Elizabethtown and Karber's Ridge. With the approval of the Regional Forester, Supervisor Ball has agreed to expedite acquisition in the region, in order that the experimental area may be established in time to construct improvements with the Impnira funds now available. It is not expected that any work by the Station can be undertaken before spring.

Ohio - Indiana

Final approval has been given to the agreements to establish small experimental areas on the Ohio and Indiana State Forests. The Ohio area consists of 120 acres on the Shawnee State Forest in southern Ohio, and the Indiana area consists of 160 acres on the Morgan-Monroe State Forest, about 40 miles south of Indianapolis.

Forest Planting

Seed Collection

The work of winging and cleaning the pine seed collected in Vinton County, Ohio, by Kellogg and Cochran was completed. A long time was required to open the cones by air drying indoors because of the lack of suitable autumn weather. Data compiled by Kellogg on this Ohio seed is as follows:

Species	Locality	Samples No.	Green of ex- wt. of tracted cones		Dry wt. Wt. of seed wings & and empty seed wings blown out		Net Equivalent wt. seed prod. per cwt. green cones	
			Lbs.	Lbs.	Lbs.	Lbs.	Lbs.	Lbs.
Shortleaf Pi Pine	Ohio	5	173 1/2	91	9.328	2.187	7.141	4.116
Pitch Pine	Ohio	2	36	--	0.515	0.130	0.385	1.069

Black Locust

In anticipation of extra temporary personnel becoming available for compilation, preliminary work on the black locust data is being done. Kellogg extracted the yield plot sheets from the locust plantation data and calculated areas for the last half of the plots. Height-diameter curves are now being prepared and checked.

Farm Woodland Management

Day is continuing the preparation of maps, charts, and graphs for his forthcoming manuscript covering the region-wide study of grazing conditions in the farmwoods of the Central States. He has been running into some difficulty in attempting to utilize certain data from the Census Reports for Kentucky and Tennessee, due to the fact that township and other minor civil boundaries are very vaguely outlined in certain sections of these states.

Diller, assisted by Day, has been organizing the data secured during the past summer on the ecological factors controlling the germination, establishment, and survival of tree seedlings in pastured woodlands following the removal of livestock. Diller is planning on using these data in connection with the dissertation for his doctorate at Ohio State, which he expects to receive in March, 1934. Following the acceptance of his dissertation, he and Day are planning to rework it into form for joint publication. Diller has secured a considerable amount of very interesting data on the effects of light, soil moisture, and air and soil temperatures on the survival of tree seedlings.

Locust Borer

Much of November has been spent by Hall and Wilford in the reexamination of black locust sample plots in Tennessee, Kentucky, Illinois, and Indiana.

Four days were spent with Mr. J. N. Knull, Inspector in the Division of Forest Insects, on a survey of bark beetles in shade tree elms in northeastern Ohio, especially in and around the City of Cleveland. This is part of an extensive survey which Mr. Knull is making to determine the distribution of insects which may act as carriers for the Dutch Elm disease.

Several days were spent in making a topographic survey of a property near Cambridge where intensive experiments for locust borer control will be initiated.

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NORTHEASTERN FOREST EXPERIMENT STATION

Gale River Experimental Forest

Work has been started on pruning and girdling of certain compartments on the forest where the production of spruce sawtimber will be the

object of management. Growth of the crop trees will also be stimulated by a selective cutting of the larger fir which is now merchantable as pulp.

Bartlett Experimental Forest

Work on the roads on the Bartlett Forest has been speeded up as a result of the assignment of a larger crew to this project by the Conservation Corps.

In connection with the cutting of wood from plots where clear cutting is to be compared with light selection on a large scale, it has been possible to obtain considerable additional data on taper and volume of hardwood species. In addition, a Conservation Corps crew is engaged in some special work to study the variability of solid contents of stacked wood as influenced by the size of the tree, the length of the stick, and the person doing the work.

Another crew is at work pruning and releasing selected trees in the irregular pine stands at the north end of the forest.

Cooperation with the White Mountain National Forest

Westveld visited several Conservation Camps in the White Mountains to go over the areas on which cultural work is being undertaken, and to instruct the camp superintendents and cultural foremen in technical aspects of the work. This has required only a day or two at each camp to date.

Lumber Code

Behre has devoted considerable time to cooperation in the formulation of a statement of conservation measures for the Northeast under Article X of the Lumber Code. At a meeting of the Northeastern Lumber Manufacturers Association the statement of the Executive Committee of the Washington conference was approved and a committee appointed with power to act in working out and transmitting to Washington a plan of action for the Northeast. The statement which the Forest Service has prepared in cooperation with other forestry agencies will be used as a starting point by this committee, and it is hoped that it may be adapted without substantial change.

Cooperating Bureaus

Spaulding spent about a week at Bartlett getting data on heart rots of living hardwoods with the aid of the CCC boys.

Those interested in improving conditions for wild life in the forest have generally encouraged the preservation or planting of hawthorn, since this provides edible fruit which is available well into the winter. This fall, however, Miller has observed that the fruit of the hawthorn is quite generally infested with a dipterous insect which causes it to drop to the ground quite early. Since this insect seems to be rather generally present on hawthorn in central New England, it would appear to greatly reduce the value of hawthorn as a winter food plant for wild life.

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NORTHERN ROCKY MOUNTAIN FOREST AND RANGE
EXPERIMENT STATION.

Range Research

A substantial amount of time and NRA funds have been used the past three months in getting a much needed office, garage, stock scales and more fences at Miles City. Most of the necessary facilities for effective work are now available for the first time.

Location, fencing, and some other preparatory work has been completed or started on four new NRA projects. One of these is to determine the effect of sagebrush eradication by burning and grubbing. Another is to determine the succession steps and the length of time required under natural reseeding to regain normal native grass cover of vegetation on an area which has been dry-farmed for a number of years and then abandoned. A third is to determine the rate of natural revegetation on an overgrazed range under total protection as compared to deferred grazing. The foregoing all center at the U.S.R.L. Experiment Station.

Artificial range reseeding is the most comprehensive of the new projects started under NRA authorization. Fall seeding has been done on depleted, burned over, or abandoned special use cultivated areas on the Custer and Helena National Forests, and on abandoned dry-farmed land at the U.S.R.L. Experiment Station. Spring seeding is to be done on a similar adjoining area and on a number of additional National Forest areas in 1934.

Fall seeding on a few privately owned dry farmed areas under a cooperative agreement has been completed, and a few more may yet be finished if weather is favorable. Spring seeding for comparisons, beginning probably next April, is to be done on adjoining areas and also on a considerable number of new cooperative areas. A number of key stockmen in different counties between Missoula and Miles City have been approached about reseeding, and their response and enthusiasm for some assistance in restoring range growth on abandoned plowed lands indicate a universal appreciation of this problem. It has been estimated that Montana has at least four million acres of land where it is now evident that the grass was turned wrong side up by the plow. Reseeding on these private lands under NRA authorization is considered largely as a demonstration rather than as strictly research in character, even though detailed records are planned for each such test. The more detailed reseeding work will be conducted at the U.S.R.L. Experiment Station and possibly to some extent on National Forest or other Federal lands. Crested wheat grass is being featured in this reseeding work, but seven other promising species have a place in the program. The set-up at old Fort Keogh also contemplates rather detailed methods to determine the range value of crested wheat grass for different classes of stock and for different seasons in comparison with native ranges there.

Fire Research

This year, for the first time, it has been possible to rate fire danger on a numerical scale. Using the daily ratings of class of fire danger, determined for each of the 12 fire forests on the basis of measure-

ments of six factors at 41 stations, and weighting these ratings according to the area represented, the average class of danger for July and August was found to be 4.03 on the Danger Meter scale of 1 to 7. On this scale, class 7 indicates the peak of danger experienced only on the worst days during a critical season. Hence, as class 4.03 is $57\frac{1}{2}\%$ of 7, July and August, 1933, brought $57\frac{1}{2}\%$ of the maximum possible danger. As this is the first season for which these measurements have been sufficiently complete and accurate to permit such a rating, comparisons cannot be made with other years. In the future, however, it should be possible to describe differences in degree of danger quite specifically.

In compiling weather data for several stations in this region, a check was made of the accuracy of the observer in computing the relative humidity percentages from wet and dry bulb temperatures. When it was found, in the first check, that the observer had made an error in 10% of his computations, another field station was checked. Whether by coincidence or not, the error here was also 10%. Then the Missoula station records were checked for the last four years, with the following results for the respective observers: Observer #1, 15 computations of humidity, with no errors; #2, 182 cases, 2.2% error; #3, 37 cases, 2.7% error; #4, 168 cases, 7.5% error; #5, 203 cases, 8.9% error; #6, 204 cases, 18.6% error; and #7, 37 cases, 19.0% error. For the total of 848 computations of humidity, 9.3% were erroneous due to lack of care in using the standard relative humidity tables.

A similar check for these computations made at the Priest River Branch from 1922 to 1933, inclusive, included 2168 measurements and showed 4.82% errors. The nine observers made the following number of computations and percentages of error: #1, 140, 2.2%; #2, 132, 2.3%; #3, 80, 2.5%; #4, 204, 2.9%; #5, 663, 3.5%; #6, 62, 4.8%; #7, 226, 6.6%; #8, 60, 6.7%; and #9, 169, 10.0%. Although this is the best record so far checked, it is obvious that all station records of humidity should be checked before final compilations are made, and that a drive should be started to reduce this error in the future.

The first phase of this drive will be an examination of the FORM of the present tables used for computing humidity. The evidence already indicates that Bulletin 235, Psychrometric Tables, offers at least two possibilities of error which can be eliminated. These are the inclusion of (1) relative humidity tables for five classes of atmospheric pressure, and (2) dew point tables for five pressures. By providing the observer with only one relative humidity table, and that for his particular station pressure, it may be possible to improve accuracy by eliminating the opportunity to use the wrong table. The Northern Rocky Mountain Station would be glad to hear from other Stations where this problem has been encountered, and even partially solved.

The 1933 fire weather records for Priest River have been coded, and as soon as the cards are punched in Washington the analysis that was commenced last winter will be continued. The fundamental relationships that exist between the many weather elements and fuel moisture on three areas having different densities of forest cover will be studied. The records for 10 fire seasons are now available for this analysis.

Forest Survey, Mapping

Four mappers have been at work on the Survey since October 10. All of the field work for Benewah County has been completed. Kootenai County is well on toward completion and a start has been made in Spokane County. Work was suspended in Kootenai County during the last week in November, in favor of Spokane County, since winter working conditions are much better in the latter. It is possible that with average working conditions the larger part of the field work in Spokane County will be done this winter.

Other winter work will include the compilation of Benewah County data and preparation for a much extended field program next season, which will include work inside as well as outside the National Forests.

Under the Civil Works program the Survey has been authorized to employ twelve men. These men will be assigned to forest headquarters in Idaho and Montana. The men will assist a designated forest officer in placing the best of the National Forest timber type data on 2-inch-to-the-mile base maps. The work will be supervised by the Forest Survey organization out of the Missoula office.

Forest Survey, Requirements

Field work completed included collection of building construction records, the timber requirements of public utilities, and studies of wood fuel consumption at Bozeman, Livingston, and Great Falls, Montana. In each of these cities, which in the order named, are the County seats of Gallatin, Park, and Cascade Counties, information on lumber and other forest products used by city and county governments was also obtained. Complete material lists were secured for a two-story stucco veneer residence and two commercial garages at Bozeman, an all wood house at Manhattan, a fireproof institution at Twin Bridges, a fireproof hospital at Dillon, and an all wood church at Lima, Montana,

Data thus far on lumber used in fireproof buildings indicate 3 to 4 board feet per foot floor area. This will be checked with additional data as soon as computations are completed. Hallaner reports 2 to 2 1/2 board feet based on records obtained in Washington and Chicago.

In addition to the study of building construction in the cities mentioned, much information concerning Electric and Telephone Utilities operating within the Region was obtained from the Montana Public Service Commission, and the Mountain States Telephone and Telegraph Company offices at Helena, Montana.

Logging and Milling

During the A.C.M. selective logging study an effort was made in the field to apply the data on tree and log grading obtained in previous ponderosa pine studies. Plot 1 of the study was clean cut of all trees 12" d.b.h. and up, while plot 3 was cut according to current Forest Service practice. Prior to cutting a grading committee composed of Neff, Bradner, and Anderson of the Forest Service, and Mason, Logging Superintendent of the Polleys

Lumber Company, made a hypothetical marking or selection of trees and logs based on our existing knowledge of tree and log lumber values. The following tabulation shows the results of this marking:

AVERAGE SELLING VALUE PER M LUMBER TALLY (1)

Method	: Selected Logs:	Rejected Logs		: All Logs	:
	: from	: Top Logs from	: Logs from	: Actually	:
	: Selected Trees:	Selected Trees:	Entire Trees:	Cut	:
	: (2)	: (3)	: Not Selected:	From	:
	:	:	: (4)	: Area	:
Clean Cut	: \$21.52	: \$13.43	: \$17.94	: \$19.52	:
For. Service	:	:	:	:	:
Selection	: \$22.44	: \$14.91	: \$18.44	: \$20.39	:

- (1) Shrinkage and depreciation considered.
- (2) Indicates value of logs designated under hypothetical marking.
- (3) Usually the 4th and 5th (top) logs of trees designated under hypothetical marking.
- (4) Inferior trees considered to be of low value in hypothetical marking.

By referring to the preceding tabulation of selling values for the clean cut area (plot 1), it is evident that the marking board raised the average value of the trees they designated for removal by \$2.00 per M (\$21.52 - \$19.52). In numerous cases the marking board designated for removal from the woods only 2 or 3 logs out of trees containing 4 or 5 logs. These rejected tops on the clean cut area (plot 1) when manufactured into lumber, showed an average selling value of \$13.43 per M, or \$6.09 below the average lumber selling value obtained by clean cutting the area. The marking board also rejected entire trees in some cases, which of course were actually cut under the clean cutting practice. These rejected trees when manufactured into lumber showed an average selling value of \$17.94 per M, or \$3.58 (\$21.52 - \$17.94) per M less than the average lumber selling value of the trees the marking board selected.

On the area cut under the standard Forest Service practice (plot 3) the marking board raised the average lumber selling value of the trees they designated for removal by \$2.05 per M, (\$22.44 - \$20.39). A further comparison of the value of rejected tops and trees for the area cut according to Forest Service practice may be made by referring to the preceding tabulation.

Silviculture

The last of the season's field activities came to a close in mid-November. One of these jobs was the 5-year remeasurement of a group of white pine yield plots on the Coeur d'Alene Forest. Another job was the establishment of several white pine thinning plots as a part of thinning and snag felling operations conducted by a small NIRA crew on the Deception Creek Experimental Forest.

The extensive work of Davis' NIRA crew comprised thinning six acres in a dense 65-year old white pine stand and felling about 3000 girdled trees in a 17-year old timber sale. The latter area of about 60 acres was an excellent example of the silvicultural benefits of girdling hemlock with the object of allowing white pine seed trees to establish a crop of reproduction of the desired species. It was equally an example of the undesirable effects, from a protection standpoint, of having a heavily snag studded area with fallen, broken-off tops littered over the ground and making a bad fire trap. As the area is located on a much-used road through the experimental forest it was decided to fire-proof it.

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PACIFIC NORTHWEST FOREST EXPERIMENT STATION

General

Things have been humming in the Experiment Station office with the additional NIRA personnel and now the CWA people. The NIRA personnel now consists of 19--8 technicians, 4 assistant technicians, and 7 draftsmen, computers and typists. At this writing all are in the office.

It was decided that this Station could accommodate with the Bureau of Entomology 48 CWA workers, provided two shifts were run and our big assembly room turned into a work room for draftsmen and map colorists. Requisition was made on the reemployment agency late Monday afternoon. The next morning many applicants called for an interview, and by afternoon several were at work. By Wednesday all but three of our quota were on duty. The above does not include 6 additional draftsmen and computers detailed to us from across the Columbia River by the Washington State Agricultural Experiment Station to compile from our records tax delinquency and forest survey data for their land use studies.

Section of Silviculture

Substantial progress was made on the fuel inflammability studies; more than 300 of the hazard indicator sticks were brought in from the field and dried to constant weight as a preliminary step in analyzing the past season's experience, the daily records for fuel inflammability received from all forests in the region were plotted, and final analyses were begun. When these analyses are completed, they will give a sound basis for deciding what size, type, species of wood, and treatment of stick will give the best results for this region.

In the visibility project, analyses of all smoke tests made last summer were practically completed, a sample model of the visibility meter was constructed, and 422 pairs of lookout goggles were tested with a photo-electric cell and otherwise for the Regional Office. About 15 percent of these goggles were rejected because of breakage or failure to meet bid specifications, and since the rejected material was valued at over \$200, the two or three days spent in testing was money, well spent.

Analyses were nearly completed for time frequency of fire discovery by lookouts. These analyses are showing much less difference in time of peak loads in fire detection between east side forests and west side forests than is commonly assumed. More than half of all fires discovered by lookouts are first seen in the afternoon, but in this respect there is much less difference between class C fires and the smaller fires than has been thought to exist.

Progress was made in preparing a comprehensive report on the Tillamook Fire. This report will include a brief statement of other large fires in the past, and in assembling information on these fires it has developed that many people who have written on this subject give information as to dates, etc., which can not be substantiated. It appears that each writer takes without question the information given by other writers who in turn obtained their information from still other writers or from "hearsay"; the result is that certain historic fires are attributed to the wrong year without much chance of the mistakes being corrected.

To suggest legislative or administrative measures that will prevent a recurrence of the recent disastrous Tillamook Fire, Governor Meier of Oregon appointed the State Forester, Regional Forester and the Director as a committee to study the existing situation and propose a desirable practice for the future. This committee held several meetings. The report recommends: (1) that the present "closed season" be declared a period of high fire hazard during which no lumbering may be done without a permit from the State Forester, who shall prescribe the precautionary measures to be taken by the operator and who shall be empowered to suspend lumbering operations on days when the fire hazard is exceptionally great, (2) that a provision be added to the forest fire code requiring all snags to be felled concurrently with logging in the region west of the Cascades, (3) that the State Forester be provided with an organization large enough to enforce strict observance of existing laws and to curb incendiarism, and (4) that a better system of roads, trails, telephone lines and other improvements for the immediate detection and suppression of fires be provided. Of these recommendations, only the first is being submitted as an emergency measure at the present special session of the Oregon legislature.

Ponderosa Pine Silviculture

Kolbe completed the regular fall examinations of the 22 methods of cutting plots on four national forests in eastern Oregon. The reproduction on these plots apparently is just about holding its own as to number of trees, Kolbe finding that for almost every new 1933 seedling there was a dead older seedling, thus leaving the total number of seedlings approximately unchanged. The seed crop in 1932 was very light, and no plot examined this fall had more than 50 new seedlings per acre. The 1933 crop of cones was heavy in several localities and considerable increase in reproduction may be expected next year.

As a basis for the Station's recommendations on desirable woods practice in the ponderosa pine region under the Lumber Code, Kolbe prepared a number of tables giving the distribution of the trees and their volume in

a number of stands in eastern Oregon. He found the volume in immature trees in virgin stands to be about 10 percent in southern Oregon, 6 percent in the central portion, and only 3 percent in the Blue Mountains. These data, comprising over 350 acres in area, indicated that a 15 percent reserve would require cutting to a minimum diameter of about 22 inches, while cutting to a 16-inch diameter means the removal of approximately 95 percent of the original volume in trees above 12 inches.

Experimental Forests

Field work for the mapping and cruising on the Pringle Falls experimental forest was discontinued when the local CCC camp was closed for the winter. All field work on this project was completed at the Wind River experimental forest covering intensively some 10,000 acres, and the office computations and drafting of maps is now well under way. It is planned to make a relief model for each of the experimental forests this winter, utilizing CCC help at Wind River. Kolbe is now preparing a report on the proposed experimental forest at Cascade Head on the Oregon Coast as a preliminary to discussion by the committee on experimental forests when this committee meets in December. Considerable construction work will be done at Wind River this winter, utilizing CCC labor to recondition all buildings, install a water system in the arboretum, and extend existing road and trails in both divisions of the experimental area. The fire protection equipment at Wind River, which has been faithfully kept in good condition for 20 years, proved its worth on November 15 when one of the buildings caught on fire. The good condition of the fire equipment plus the prompt action of the men at the station saved the building with little damage.

Natural Areas

Kolbe revisited the proposed natural area in the spruce-hemlock type at Cape Perpetua and is preparing a report on this area for the committee on natural areas. Since the original report was written, a great deal of recreational development has taken place on this area, and some changes in the original plan must be made before the area can be recommended for withdrawal.

Mensuration

Several new sets of thinning plots in Douglas fir were launched with the help of the forest organization on the Columbia and Olympic National Forests and the CCC camps. On the Olympic, the Office of Forest Management of the Regional Office and the Experiment Station collaborated in defining the marking rules for thinning a 60-year-old stand, the actual work of felling to be done by the local CCC camp under the direction of the Forest office, and the wood to be used as fuel in the winter camp. Later, six or more sample plots will be established on the area.

Likewise, a thinning project was laid out on the Columbia Forest within the Wind River Experimental Forest for the CCC boys to do. Two stands, one 20 years old and the other 30 years old, were marked for immediate thinning and pruning. Five plots will be established later when the cutting is finished.

A start has been made in predicting the growth of forest stands in several counties for the forest survey. Probably several months will be required to cover statistics of the entire Douglas fir region, unless radical short cuts are developed for handling the complexity of type, stocking, and site distinctions.

Forest Insurance

Shepard returned to Portland from California just before the first of November, and has since been mainly engaged in bringing the study of the sugar pine region along. This has involved preparation of basic figures for fundamental integration and work on the climatic phase. In addition some time has been spent on the planning of and preparatory work for the promotion phase of the study, principally that having to do with the making of samples of maps such as might be used in underwriting.

Forest Economics

New Public Domain

Field numerical and map data pertaining to the location and amount of tax delinquent and publicly owned lands were computed and compared for Douglas, Grays Harbor and Snohomish Counties preparatory to plotting these data on inch-to-the-mile county maps. The Jefferson County map of tax delinquent and publicly owned lands was completed and prints were made thereof.

A report on variation of assessment and taxation of selected timberlands in four Oregon counties covering 195 cases was completed for and delivered to the state legislative interim timber taxation committee.

Several requests for data emanating from county and state officials and from the research departments of institutions of higher learning and of other bodies have been received. A small portion of these requests could be satisfied.

The following talks were made by Mr. Wilson:

November 4 - No Man's Land	To American Association of University Women at Portland.
November 9 - No Man's Land	To Portland Executives Association at Portland.
November 18 - Planned Land Use	University of Oregon and Oregon State College at Corvallis, Ore.
November 20 - No Man's Land	To Twentieth Century Club at Portland
November 21 - No Man's Land	To Exchange Club at Portland
November 24 - Tax Delinquency and Land Utilization	To Washington State College at Pullman.

The Corvallis meeting, instigated largely by this Station, was called at the request of Tillamook County officials and was attended by both Wilson and Andrews. Andrews explained the Michigan surveys and procedure, and

showed the scope of the forest survey as applied to Tillamook County. The meeting resulted in a proposal that may lead to a comprehensive inventory of physical and economic factors affecting land use and human existence in that county--which would be a most useful outgrowth of the new public domain study.

Selective Logging in Douglas Fir

Brandstrom and Rapraeger, accompanied by Messrs. Nichols and Liersch of the Crown Willamette Pulp and Paper Company, made a three-day field trip to the Herman Creek timber sale unit of the Umpqua National Forest. The purpose of the trip was to go over the area to determine to what extent it might lend itself to selective logging with tractors and trucks. A memorandum on the conclusions from the trip has been prepared.

A considerable number of copies of Brandstrom's "Logging Costs and Operating Methods in the Douglas Fir Region" have been distributed by this office, and many acknowledgments speaking very favorably of it have been received. The response is more than gratifying.

Much of Brandstrom's time has been devoted to correspondence arising from the distribution of this bulletin and to conferences and work in connection with the proposed Wind River selective cutting timber sale. At the end of the month Rapraeger was assigned to work with Brandstrom pending a greater need of his services in Products. The former has begun to compile data on price increment in Douglas fir and ponderosa pine.

Forest Survey

During November preliminary tracings of the new 1/4-inch-to-the-mile state base maps for the east halves of Oregon and Washington were completed and several sets of blue line prints run off. These prints were mailed out to various individuals in the region for inspection and correction. A set was also distributed through the local Forest Service offices for correction. It is hoped that the corrected tracings may be forwarded to Washington for lithographing in January.

The Regional Office of Maps and Surveys has made material progress in drafting the new 1-inch-to-the-mile base maps of western Oregon and Washington on which the Survey's detailed type data will be printed. When these maps are finished, the Douglas fir region will have available for its entire area three sets of base maps--1/4-inch-to-the-mile, 1/2-inch-to-the-mile, and 1-inch-to-the-mile. The Douglas fir region is probably the only forest region in the United States which now has such a complete set of different scale base maps for the entire region.

Arrangements were made with the Regional Office for the transfer of \$15,000 of NIRA money to the Experiment Station account for the prosecution of the survey in eastern Oregon and Washington. This is in addition to \$5,000 which Regional Forester Buck had last month made available to the Survey.

Briegleb and Litchfield worked practically the entire month in the vicinity of Bond experimenting on mapping technic for both clear and

selectively cut ponderosa pine types. While in this territory they took sample plots in juniper types in order to get a notion as to the percent of ground surface covered by so-called "dense" and so-called "scattered juniper" types. Sample plots were taken so as to show both number of trees per acre and the crown diameter of each tree. In the densest juniper stand which was found, a series of plots showed that the crowns only occupied about 16 percent of the ground surface, and stands which were classed as "scattered" by casual inspection were found to occupy from 4 to 6 percent of the ground surface.

Four of the Survey's check cruisers, together with compassmen, have been check cruising in Lake and Klamath Counties in eastern Oregon, and it now appears that the county cruises for these two counties, both of which cover the entire merchantable private timber area in the counties, are of a quality to be used when adjusted. It appears that these are the only two counties in either eastern Oregon or Washington where there are county cruises which can be used by the Survey.

From the map angle, the final product of the Survey will consist of three sets of type maps: (1) 1-inch-to-the-mile detailed type maps, one map for each county. These maps will show all the detail of types as the types were mapped in the field; (2) the generalized 1/2-inch-to-the-mile county type maps on which the detailed type data have been generalized into some eight or ten major land use types, and (3) the state-wide 1/4-inch-to-the-mile type maps on which the detailed type data have been generalized into some eighteen or twenty types. A different set of type legends has been devised for each of these three sets of maps and the Survey staff is now working on the problem of trying to correlate certain standard colors so that in so far as possible, there will be a general color plan followed in the production of each of these three sets of maps.

November saw an unusual run of requests for both type and volume Survey data. The Regional Office, Public Works Administration, State Tax Commission, authors of texts dealing with forest situations and others, all made use of Survey data.

Early in November Doctor Hartman of the Bureau of Agricultural Economics visited the Survey and was very much interested in the type maps which were being prepared.

Section of Forest Products

General

Interest in Oregon fir balsam is evidenced by inquiries from New York purchasers. Some time has been spent trying to locate producers, most of whom appear to have given up collection because of low prices.

An inquiry on pulp species in Montana by the district PWA representative was answered and also referred to the products office in Region 1.

A request by a local commercial writer for information on wood preservation in the West was answered.

As a result of the article "Oregon White Oak: Its Properties and Uses" in the September issue of The Timberman, the western representative of the Burlington Refrigerator Express Company, Fruit Grower's Express Company, and Western Fruit Express Company called at this office relative to the use and source of this wood for stuffing refrigerator cars. In the past eastern white oak and hard maple have been shipped into this territory for this use. In this connection, bigleaf maple was suggested as a substitute for the hard maple.

The article "The Small Sawmill Industry in the Douglas Fir Region" in the October issue of The Timberman resulted in a request from a southern preservative concern relative to the stain and mold problem as it confronts the small mill operator.

Forest Survey

The report "Cutting Depletion Phase of the Forest Survey in Western Washington and Western Oregon" is completed and ready for review.

Farm Timberland--Conversion Factors

The remainder of the cordwood volume data secured near Molalla, Oregon have been computed. Fifty-two cords of old growth Douglas fir cordwood showed an average wood and bark content of 91.5 cubic feet. The average cord contained 82 sticks, each with an average end area of 40 square inches. Six cords of heavy second growth showed 85 sticks and 88 cubic feet of wood and bark per cord. In 16 cords of cottonwood pulpwood, there was an average of 130 sticks per cord and 85.5 cubic feet of solid wood.

Douglas Fir Mill Production Study

A draft of the combined report covering two Willamette Valley Douglas fir mills studied in 1932 is now at the Regional Office for suggestion and criticism.

Financial Aspects of Ponderosa Pine Management

Rapraeger spent considerable time revising the final draft of the report "Financial Aspects of Ponderosa Pine Forest Management Under Public Ownership" and in preparing a first draft on the private ownership phase of this study. He is now assisting Brandstrom in the selective logging in Douglas fir project.

Cooperation

Two cords each of western hemlock and lowland white fir were shipped from Scappoose, Oregon, to the Forest Products Laboratory for pulping

experiments. During the past three years, the equivalent of about 20 cords of wood, including Douglas fir, western hemlock, and lowland white fir, also both forest wood and mill waste, have been shipped to the Laboratory for pulp tests.

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SOUTHERN FOREST EXPERIMENT STATION

Naval Stores

Harper attended the naval stores code hearings in Jacksonville, Fla., and reported the almost unanimous agreement on a conservation clause restricting turpentine to trees larger than 9 inches d.b.h. Exceptions could only be obtained by special permission of the Secretary of Agriculture and the Control Board.

One naval stores producer proposed curtailment of production by dropping streaks at different seasons of the year. This brought up the question of predicting yields for single streaks at different times during the chipping season. Work recently completed at Lake City shows that yields can be predicted from weather factors, the chief of which is air temperature.

Analysis of one of the Station's gum yield tests indicated that for slash pine the eighth year of working produced 19 percent less gum than the first year, but only 6 percent less for longleaf. This indicates that trees can be worked for eight years instead of the usual five or six, and without a serious decline in yield during the last years.

The longleaf trees defoliated by hand in the spring of 1933 gave 43 percent less gum yield in 1933, when completely defoliated and approximately 20 percent less yield when partially defoliated, as compared to the untreated check trees.

Forestation

Wakeley selected an experimental planting area on the Kisatchie National Forest near Alexandria, Louisiana. The area covers parts of three sections of typical longleaf pine land, contains three soil types, only scattering residual trees and practically no natural reproduction. Part of the area is entirely free from brush, while a part includes brush of varying ages and densities. The site appears almost ideal for planting of experiments such as studies of different spacings in plantations; effect of mixture of species; sources of seed; etc.

Management

A report prepared jointly by members of the Southern Station and the Bureaus of Animal Industry and Plant Industry, on their 10-year study of the effects of fire and grazing on growth and reproduction of longleaf

pine and of forage plants, and on the livestock carrying capacity of woodland pastures at McNeill, Miss., was completed.

New Public Domain

A general report on the tax-delinquency situation, and on the general physiographic, fiscal, and legal conditions of Arkansas was completed during the month.

Financial Aspects

Reynolds completed the marking of a one year's cut of virgin and second-growth shortleaf-loblolly pine timber, under a cooperative agreement between a large lumber company and the Southern Forest Experiment Station. The timber is to be cut selectively and the logging operation will be studied by the Financial Aspects Staff.

Forest Survey

The beginning of the month found the Survey in the process of giving intensive field training to its expanded forces. Lehrbas, Cruikshank, and Faulks established a training school at Poplarville, Mississippi, for 9 new crew chiefs and 9 assistant technicians. Putnam and Davis opened a school at Lake Providence, Louisiana, in the hardwoods, with a class of 6 crew chiefs and 9 assistant technicians. The men were given about four weeks uninterrupted and intensive training. Lehrbas' group then moved to Lake City, Florida, on November 20th, and shortly thereafter began work on the Survey lines in Unit No. 1 in southeast Georgia and Unit No. 1 in northeast Florida. Lehrbas will be in charge of the field work in the Southeast, with headquarters at Lake City, Florida.

At the end of the month, Putnam had 6 crews at work on the lines in Hardwood Unit No. 1 in northern Louisiana. He will be in charge of a group of three crews in the Delta hardwoods. Davis will take three crews from the present Delta hardwood group into the Tennessee Valley as soon as appropriations for that work have been finally allotted.

During the month a part of the computing force necessary for the analysis of field data were assembled and given preliminary training under Wheeler and Mrs. Olsen. Many last minute changes, modifications, and corrections in the field manuals for the two jobs have kept Eldredge and Winters fully occupied. The field force of the Survey is not yet fully recruited. It was decided to wait until the Assistant Technician and Junior Forester eligible lists were available before taking on additional men.

The tables which make up 90 percent of the office report for the Mississippi Hardwood Unit No. 1 were completed during the month.

A working plan for a supplementary study of the effect of turpentine on growth in naval stores timber was drawn up and sent to the field for consideration.

Girard arrived from Washington and with Eldredge, Winters, and Wheeler worked out a plan for gathering information for a series of volume tables for Florida Unit No. 1. Girard started this work in the field on November 21st, near Lake City.

Forest Pathology

During November, Siggers made surveys in Louisiana, Florida, and Georgia to obtain additional information on the Brown-Spot Needle Blight of longleaf pine seedlings as related to the period elapsed since burning. A paper entitled, "Nursery Control of the Brown-Spot Needle Blight of Pine Seedlings," was prepared as one of the Southern Station's "Occasional Papers."

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RESEARCH IN REGION 2

The activities engaged in during the month of November, during the transition from field to office, were largely administrative in character. Mild weather throughout the month, however, made it possible to clean up all such field jobs where accomplishment had been delayed owing to the very heavy schedule of field activity during the year. Short excursions from the office were made each week: two of these being to the Fremont Field Station, one to the Salt Creek country on the Pike Forest, and another to the Gardner District on the San Isabel Forest. The purpose of the two latter trips was to inspect the field installations in connection with erosion progress and control studies, to check the technic and system of erosion profile measurement, and to lend assistance to the administrative organization in making the prescribed annual examinations.

Pe, Pike (Salt Creek)

An improved method of profile measurement was worked out. Data were procured for the established profiles in Plot 1 (fenced) and Plot 2 (unfenced) and the profiles were plotted. The changes since 1932 have not been large, as was to be expected in the absence of any serious storms during the summer, but the results indicate that the checking of erosion by natural means proceeds very slowly in a soil type that at best supports only an open ground cover. A comparison of the plotted profiles of 1932 and 1933 shows there has been an increase in the cross-sectional area of the profile located at the very head of each gully, while in the case of the other profiles there has been a decrease of area which indicates filling-in. The maximum change amounted to about 7% of the 1932 cross-sectional area. The effect of protection is not yet evident from the data. It is ocularly evident, however, that the cover species are beginning to occupy more of the ground where erosion is still in the incipient, or sheet and shoestring, stage.

Pe, San Isabel (Cottonwood Creek)

Near the end of November, the gully transects, established in 1932, were visited and remeasured. these are located near the head of the

Cottonwood Creek drainage basin in the open grassland type which characterizes practically the entire southwest slope of the Greenhorn Mountains. The opportunity was had on this trip to study also the erosion situation in this particular locality. In some respects, namely, with reference to the damage done to stream channels and the feasibility of instituting control operations, the local condition is more serious than in any other place along the Eastern Slope in Colorado. Its seriousness is enhanced by the fact that erosion here is interfering with forest administration since practically all of the roads and truck trails, also the logical routes of these, are gradually being washed out. Overgrazing, with its concomitant depletion of the forage cover and breaking of the sod, is primarily responsible for erosion in this territory.

Mc 161, Fremont

The equivalent of about one week's time was spent in remeasuring the stand, both aspen and coniferous, on the four plots involved in the Douglassfir cutting methods study within the Fremont Experimental Forest. These plots were established in 1913-14 and when the data are compiled a twenty-year record of growth after selection, shelterwood, and clear-cutting will be available.

C.C.C. and Nira Activity

On the first of the month, the work of installing the two new series of thinning study plots in the Black Hills Forest at the Nemo Center was completed. During the month, the field notes covering the work done at several centers by C.C.C. crews under technical supervision were transmitted to the experiment station. By December 1, 790 mandays of C.C.C. time had been spent on work pertaining to experiment station projects.

On November 29, Roeser accompanied Supervisor Keithley on a trip to the Black Forest near Colorado Springs to study the possibilities involved in employing the men that are to be enrolled in the Black Forest transient camp in thinning ponderosa pine stands on private and state lands.

Plans are also in the making for employing Nira help during the winter months both at the Fremont Station to engage in improvement work and in the Colorado Springs office to assist in compilation work.

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Reversion of Forest Land for Taxes Increasing in the South. (For Southern Lumberman) R. B. Craig.

PACIFIC NORTHWEST

Vertical Air Currents May Explain Occasional Long Distance Seeding From Forest Trees (For Service Bulletin) Leo A. Isaac.

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Weather During the Tillamook Fire, August 1933 (for The Timberman) W. G. Morris, and C. I. Dague.

Report of the Committee on Prevention of Forest Fires to Governor. Julius L. Meier. T. T. Munger, L. F. Cronemiller and S. J. Buck.

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The Climbing Method for Taking Tree Measurements in Plantations of the Central States. (For Jour. Forestry) L. F. Kellogg.

LAKE STATES

A Method for Studying Drought Resistance in Plants (For Science) Hardy Shirley.

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Diameter Distribution for Old Field Loblolly Pine Stands in Maryland (For JAR) G. L. Schnur.

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The Importance of the Origin of Seed Used in Forestry (For Jour. For.)
H. H. Hasel.

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Some Effects of Three Annual Fires on Growth of Longleaf Pine. (For
Jour. of Forestry.) A. L. MacKinney.

A Method for Measuring Experimental Forest Fire Temperatures. (For
Jour. of Forestry.) R. M. Nelson, and I. H. Sims.

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